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EXAMINER	
TRAN, KHANH C	

ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/535,303	NAMURA, YASUAKI	
	Examiner	Art Unit	
	Khanh Tran	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *3-10,13-19,29 and 30* is/are allowed.

6)☒ Claim(s) *1,2,11,12,20-22,25 and 28* is/are rejected.

7)☒ Claim(s) *23,24,26 and 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 March 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The Amendment filed on 09/28/2005 has been entered. Claims 1-30 are pending in this Office action.

Response to Arguments

2. Applicant's arguments filed on 09/28/2005 have been fully considered but they are not persuasive.

On page 24 of the Amendment, Applicants amended claim 1 to include new limitations "*said local oscillation signal is provided to another of said pair of first quadrature mixers with a phase shifted or not shifted without regard to said band switching signal*". Applicants argue that there are no teachings of Kudou's reference of such feature.

The Examiner responds that in column 10 lines 57, see also figure 1, it is true that switches SW1 and SW2 are operated through the selection signal S29 for selecting either frequency band 150 MHz and 300 MHz. The variable phase shifter 11 delays or advances the phase of the inputted signal SIQ by 45^0, thereby outputting the in-phase local signal SI of the frequency fcvo or 2 fcvo to the frequency mixer 3. The variable phase shifter 12 advances or delays the phase of the inputted signal SIQ by 45^0, thereby outputting the quadrature-phase local signal SQ of the same frequency fcvo or 2 fcvo as the local signal SI to the frequency mixer 4. Thus, the in-phase and quadrature-phase local signals SI and SQ have a same frequency and a phase

difference of 90.degree. *However, if the intended frequency band stays the same (**no band switching signal**), switches SW1 and SW2 always stay at one position. As result of that, the local frequency fvco of the local signal S20 is provided to one of mixers 3 and 4 with a phase shifted optimized for the selected frequency band*.

With regard to claim 11, Applicants amended claim 11 to include new limitations "*providing local oscillation signal, with said phase shifted or not shifted without regard to said band switching signal, to a second quadrature mixer, also for converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal*". On page 25, Applicants argues there are no teachings of Kudou's reference of such feature.

The Examiner responds that claim 11 is rejected on the same ground as for claim 1 because of similar scope. Furthermore, mixers 3 and 4 convert the reception signal into a reception baseband signal.

On page 24 of the Amendment, Applicants amended claim 2 to include new limitations "*said local oscillation signal is provided to another of said pair of first quadrature mixers with a phase shifted or not shifted without regard to said band switching signal*". Applicants argue that Liu does not teach the cited claims elements.

The Examiner responds that referring to 3A, as recited in the last Office action, switch 32 is cited to change the phase of a signal input to mixers 16 and 18 depending on either Upper Sideband generation or Lower Sideband Generation. In column 5 lines

10-40, Liu teaches that the desired sideband output can be electronically selected through a control signal applied to switch 32. In view of that, the control signal acts as a band-switching signal. Nevertheless, using the same argument as in claim 1, the control signal only applies to the switch 32 when selection of the desired sideband output. Otherwise, the switch 32 always stays at a position corresponding to the selected sideband output. Therefore, mixers 16 and 18 are always provided with a phase shifted or not shifted without regard to the control signal.

On page 25 of the Amendment, Applicants amended claim 12 to include new limitations and argue that Liu does not teach the cited claims elements.

The Examiner responds that using argument similar to claim 2, claim 12 is rejected on the same ground as for claim 2 because of similar scope.

On page 25, Applicants erred in arguing that claim 21 is patentable over Liu as well. Claim 21 is rejected as being obvious over Kudou US Patent 6,337,976 B1. Further on pages 25-26, Applicants argue that claim 22 is not obvious under 103(a) over Kudou US Patent 6,337,976 B1.

The Examiner responds that as recited in the last Office action Kudou does not expressly disclose polarities of quadrature components of the reception baseband signal irrespective of an operating band of the apparatus as claimed in the application claim. However, in column 10 lines 10-50, Kudou teaches the variable phase shifters 11 and 12 of figure 1 are *optimized* for each case, e.g. the frequency band of 150 MHz and

frequency band of 300 MHz. Because the variable phase shifters 11 and 12 are *optimized* for each frequency band, it would have been obvious for one of ordinary skill in the art at the time of the invention was variable phase shifters 11 and 12 can be modified to shift in such a way that the polarities of the quadrature components are correct in each frequency band.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Kudou U.S. Patent 6,337,976 B1.

Regarding claim 1, Kudou invention is directed to a selective-calling radio receiver using the direct conversion method that makes it possible to commonly use a VCO and its neighboring component for *different frequency bands*; see column 3, lines 45-50. Hence, the receiver corresponds to the claimed "multiband data communication apparatus".

Figure 1 illustrates a receiver comprising a frequency-mixer/demodulator IC 50, a decoder 10, two variable phase shifters 11 and 12, four constant voltage sources 17a, 17b, 18a, and 18b, two frequency multipliers 13 and 14, a PLL frequency synthesizer 70, and a controller 60; see column 6, lines 20-30. The frequency-mixer/demodulator IC 50, two variable phase shifters 11 and 12, four constant voltage sources 17a, 17b, 18a, and 18b, two frequency multipliers 13 and 14, a PLL frequency synthesizer 70 form the claimed quadrature demodulating means.

In column 6, lines 30-40, the frequency-mixer/demodulator IC 50 includes two frequency mixers 3 and 4, two low-pass filters 5 and 6, two baseband amplifiers 7 and 8 and a demodulator 9. In light of the foregoing, the frequency-mixer/demodulator IC 50 includes a quadrature demodulator for direct converting the reception signal as claimed.

In column 6, lines 10-20, the receiver in figure 1 serves as a paging receiver and is applicable to two frequency bands of 150 MHz (e.g. 135 MHz to 175 MHz) and 300 MHz (e.g. 270 MHz to 350 MHz). The PLL frequency synthesizer 70 includes a VCO 20, a low-pass filter 21, a charge pump 22, a phase detector or a phase comparator 23, a reference oscillator. The PLL frequency synthesizer 70 provides a local in-phase signal SI and the local quadrature-phase signal SQ, the in-phase signal SI and the quadrature-phase signal SQ are selected one of the frequency multipliers 13 and 14, and the phase shifters 11 and 12. In light of the foregoing, the PLL frequency synthesizer 70

performs equivalent function of the local oscillator means as claimed in the application claim.

In column 10, lines 35-50, the variable phase shifter 11 *delays or advances* the phase of the inputted signal SIQ by 45^0, thereby outputting the in-phase local signal SI of the frequency fcvo or 2 fcvo to the frequency mixer 3. The variable phase shifter 12 *advances or delays* the phase of the inputted signal SIQ by 45^0, thereby outputting the quadrature-phase local signal SQ of the same frequency fcvo or 2 fcvo as the local signal SI to the frequency mixer 4. In column 10, lines 5-30, if the receiver is used for frequency band of 300 MHz, the multiplier 13 with the multiplication factor of two is used by activating the corresponding constant current sink 15 through the selection signal S29. For frequency band of 150 MHz, the multiplier 14 with the multiplication factor of unity is used by activating the corresponding constant current sink 16 through the selection signal S29.

In view of the foregoing, for frequency band of 150 MHz, the variable phase shifter 11 *delays* the phase of the inputted signal SIQ by 45^0, thereby outputting the in-phase local signal SI of the frequency fcvo, and the variable phase shifter 12 *advances* the phase of the inputted signal SIQ by 45^0, thereby outputting the quadrature-phase local signal SQ of the frequency fcvo. Thus, the in-phase and quadrature-phase local signals SI and SQ have the same frequency and phase difference of 90^0.

For frequency band of 300 MHz, the variable phase shifter 11 *advances* the phase of the inputted signal SIQ by 45^0, thereby outputting the in-phase local signal SI of the frequency 2 fcvo, and the variable phase shifter 12 *delays* the phase of the inputted signal SIQ by 45^0, thereby outputting the quadrature-phase local signal SQ of the frequency 2 fcvo. The selection signal S29 corresponds to the claimed band-switching signal. Thus, the in-phase and quadrature-phase local signals SI and SQ have the same frequency and phase difference of 90^0.

In column 10 lines 57, see also figure 1, it is true that switches SW1 and SW2 are operated through the selection signal S29 for selecting either frequency band 150 MHz and 300 MHz. The variable phase shifter 11 delays or advances the phase of the inputted signal SIQ by 45^0, thereby outputting the in-phase local signal SI of the frequency fcvo or 2 fcvo to the frequency mixer 3. The variable phase shifter 12 advances or delays the phase of the inputted signal SIQ by 45^0, thereby outputting the quadrature-phase local signal SQ of the same frequency fcvo or 2 fcvo as the local signal SI to the frequency mixer 4. Thus, the in-phase and quadrature-phase local signals SI and SQ have a same frequency and a phase difference of 90.degree. *However, if the intended frequency band stays the same (**no band switching signal**), switches SW1 and SW2 always stay at one position. As result of that, the local frequency fvco of the local signal S20 is provided to one of mixers 3 and 4 with a phase shifted optimized for the selected frequency band*.

Regarding claim 11, claim 11 is rejected on the same ground as for claim 1 because of similar scope. Claim 1 claims a multiband data communication apparatus has elements, which can perform all the steps as set forth in claim 11.

4. Claims 2 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu U.S. Patent 6,496,545 B1.

Regarding claim 2, Liu invention is directed to a single sideband mixer system highly suited for generating dual-band (i.e., upper and/or lower sidebands) carrier signals for frequency translations with electronic band selection capability. In column 4, lines 40-65, figure 3 illustrates a dual-frequency single-sideband mixer system, which corresponds to the claimed multiband data communication apparatus.

Figure 3A shows an alternative system including an all-pass 90^0 phase shifter 120, and mixers 16 and 18, switch 32, an all-pass 90^0 phase shifter 140; see column 8, lines 30-65.

The mixers 16 and 18, switch 32, an all-pass 90^0 phase shifter 140 form the claimed quadrature modulating means for converting a baseband signal into a transmission signal V_{out}.

The all-pass 90^0 phase shifter 140 provides a local oscillation signal.

The all-pass 90^0 phase shifter 140 and switch 32 form the claimed phase shifting means. Switch 32 is controlled by a control signal to determine which output of the phase shifter 140 is applied to mixer 16 and which is applied to

mixer 18. That is, for one condition of the switch 32, the outputs V21 and V22 of phase shifter 140 are applied to VA1 and VB1, and for other condition of switch 32, V21 is applied to VB1 and V22 is applied to VA1. In light of the foregoing teachings, depending of the switching condition, VA1 and VB1 have different phases. The control signal corresponds to the claimed band-switching signal.

In column 5 lines 10-40, Liu teaches that the desired sideband output can be electronically selected through a control signal applied to switch 32. In view of that, the control signal acts as a band-switching signal. Nevertheless, using the same argument as in claim 1, the control signal only applies to the switch 32 when selection of the desired sideband output. Otherwise, the switch 32 always stays at a position corresponding to the selected sideband output. Therefore, mixers 16 and 18 are always provided with a phase shifted or not shifted without regard to the control signal.

Regarding claim 12, claim 12 is rejected on the same ground as for claim 2 because of similar scope. Claim 2 claims a multiband data communication apparatus has elements, which can perform all the steps as set forth in claim 12.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 20-22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kudou U.S. Patent 6,337,976 B1.

Regarding claim 20, claim 20 is rejected on the same ground as for claim 1 because of similar scope. Claim 1 claims a multiband data communication apparatus has elements, which can perform all the steps as set forth in claim 20.

Kudou, however, does not disclose a storage medium for storing thereinto a computer readable program used to execute the communication method of the multiband data communication apparatus as recited in claim 11. However, as known in the art of computer programming, a person of average skill in the art can implement a program storing in a storage medium (e.g. hard drive) for executing the communication method as set forth in the application claim. Motivation for doing that is to simulate the steps for testing purposes before actual implementation.

Regarding claims 21-22, claims 21-22 are rejected on the same ground as for claim 1 because of similar scope. Furthermore, as recited in claim 1, for frequency band of 150 MHz, the variable phase shifter 11 *delays* the phase of the inputted signal SIQ by 45^0, thereby outputting the in-phase local signal SI of the frequency fcvo, and the variable phase shifter 12 *advances* the phase of the

inputted signal SIQ by 45^0, thereby outputting the quadrature-phase local signal SQ of the frequency fcvo.

For frequency band of 300 MHz, the variable phase shifter 11 *advances* the phase of the inputted signal SIQ by 45^0, thereby outputting the in-phase local signal SI of the frequency 2 fcvo, and the variable phase shifter 12 *delays* the phase of the inputted signal SIQ by 45^0, thereby outputting the quadrature-phase local signal SQ of the frequency 2 fcvo. The selection signal S29 corresponds to the claimed band-switching signal.

Kudou does not expressly disclose polarities of quadrature components of the reception baseband signal irrespective of an operating band of the apparatus as claimed in the application claim. However, in column 10 lines 10-50, Kudou teaches the variable phase shifters 11 and 12 of figure 1 are *optimized* for each case, e.g. the frequency band of 150 MHz and frequency band of 300 MHz. Because the variable phase shifters 11 and 12 are *optimized* for each frequency band, it would have been obvious for one of ordinary skill in the art at the time of the invention was variable phase shifters 11 and 12 can be modified to shift in such a way that the polarities of the quadrature components are correct in each frequency band.

In column 10 lines 57, see also figure 1, it is true that switches SW1 and SW2 are operated through the selection signal S29 for selecting either frequency band 150 MHz and 300 MHz. The variable phase shifter 11 delays or advances the phase of the inputted signal SIQ by 45^0, thereby outputting the in-phase local

signal SI of the frequency fcvo or 2 fcvo to the frequency mixer 3. The variable phase shifter 12 advances or delays the phase of the inputted signal SIQ by 45^0, thereby outputting the quadrature-phase local signal SQ of the same frequency fcvo or 2 fcvo as the local signal SI to the frequency mixer 4. Thus, the in-phase and quadrature-phase local signals SI and SQ have a same frequency and a phase difference of 90.degree. *However, if the intended frequency band stays the same (**no band switching signal**), switches SW1 and SW2 always stay at one position. As result of that, the local frequency fvco of the local signal S20 is provided to one of mixers 3 and 4 with a phase shifted optimized for the selected frequency band.*

Regarding claim 25, as recited in claim 1,

for frequency band of 150 MHz, the variable phase shifter 11 *delays* the phase of the inputted signal SIQ by 45^0, thereby outputting the in-phase local signal SI of the frequency fcvo, and the variable phase shifter 12 *advances* the phase of the inputted signal SIQ by 45^0, thereby outputting the quadrature-phase local signal SQ of the frequency fcvo.

For frequency band of 300 MHz, the variable phase shifter 11 *advances* the phase of the inputted signal SIQ by 45^0, thereby outputting the in-phase local signal SI of the frequency 2 fcvo, and the variable phase shifter 12 *delays* the phase of the inputted signal SIQ by 45^0, thereby outputting the quadrature-phase local signal SQ of the frequency 2 fcvo.

Kudou, however, does not teach while said phase shifting means supplies one of a signal obtained by delaying the phase of said local oscillation signal by $\pi/2$ and a signal obtained by advancing the phase of said local oscillation signal by $\pi/2$ to the other of said pair of first quadrature mixers in response to said band switching signal.

As taught by Kudou and recited above, the variable phase shifters 11 and 12 can advance and delay the phase so that in-phase and quadrature-phase local signals SI and SQ always have the same frequency and phase difference of 90^0. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention Kudou teachings can be modified so that for frequency band of 150 MHz variable phase shifter 11 delays the phase of the inputted signal SIQ by 90^0 instead of 45^0 thereby outputting the in-phase local signal SI of the frequency fcvo, and the variable phase shifter 12 outputs the quadrature-phase local signal SQ of the frequency fcvo; and for frequency band of 300 MHz, the variable phase shifter 11 *advances* the phase of the inputted signal SIQ by 90^0 instead of 45^0, thereby outputting the in-phase local signal SI of the frequency 2 fcvo, and the variable phase shifter 12 outputs the quadrature-phase local signal SQ of the frequency 2 fcvo. Motivation is for each case only one phase shifter shifts the phase of the local oscillation signal to have less phase error than utilizing both phase shifters.

6. Claim 28 rejected under 35 U.S.C. 103(a) as being unpatentable over Liu U.S. Patent 6,496,545 B1.

Regarding claim 28, Liu does not expressly teach while said phase shifting means supplies one of a signal obtained by delaying the phase of said local oscillation signal by $\pi/2$ and a signal obtained by advancing the phase of said local oscillation signal by $\pi/2$ to the other of said pair of second quadrature mixers in response to said band switching signal as claimed in the application claim.

Referring to figure 3A, as recited in claim 2, the all-pass 90^0 phase shifter 140 provides a local oscillation signal. The all-pass 90^0 phase shifter 140 and switch 32 form the claimed phase shifting means. Switch 32 is controlled by a control signal to determine which output of the phase shifter 140 is applied to mixer 16 and which is applied to mixer 18. That is, for one condition of the switch 32, the outputs V21 and V22 of phase shifter 140 are applied to VA1 and VB1, and for other condition of switch 32, V21 is applied to VB1 and V22 is applied to VA1. In light of the foregoing teachings, depending of the switching condition, VA1 and VB1 have 90^0 phase difference. The control signal corresponds to the claimed band-switching signal. Because V21 is a cosine signal and V22 is a sine signal, one of ordinary skill in the would have recognized that the all-pass 90^0 phase shifter 140 performs equivalent of advancing and delaying the phases of ω_2 (local oscillation signal) in response to the control signal.

Allowable Subject Matter

7. Claims 3-6 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 3 and 13, claims are allowed over the prior art of record because the cited references taken individually or in combination fail to particularly disclose a multiband data communication apparatus comprising "*phase shifting means for shifting a phase of said local oscillation signal based upon said band switching signal to thereby supply the phase-shifted local oscillation signal to one or both of said pair of first quadrature mixers and to one or both of said pair of second quadrature mixers* ".

8. Claims 7-10 and 29-30 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 7-9, claim is allowed over the prior art of record because the cited references taken individually or in combination fail to particularly disclose a multiband data communication apparatus comprising "*storage means for saving thereinto discrete data of a frequency pattern component functioning as a base*" and "*address generating means for generating an address every pre-selected clock*" and "*first analog converting means for analog converting data which is read out by addressing said storage means based on the address outputted from said address*

generating means to thereby supply the analog-converted data to one of said pair of first quadrature mixers" and "*second analog converting means for analog converting data which is read out by addressing said storage means based on the output of said phase shift means to thereby supply the analog-converted data to the other of said pair of first quadrature mixers*".

9. Claims 13-16 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 13, claim is allowed over the prior art of record because the cited references taken individually or in combination fail to particularly disclose a communication method of a multiband data communication apparatus including "*shifting a phase of said local oscillation signal in response to the band switching signal to thereby supply the phase-shifted local oscillation signal to one or both of a first quadrature mixer and a second quadrature mixer, said first quadrature mixer converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal, and said second quadrature mixer converting a transmission baseband signal into either the transmission signal or the transmission intermediate frequency signal*".

10. Claim 17 is allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 17, claim is allowed over the prior art of record because the cited references taken individually or in combination fail to particularly disclose a communication method of a multiband data communication apparatus comprising "*a storing step for saving discrete data of a frequency pattern component functioning as a base*" and "*an address generating step for generating an address every preselected clock signal*" and "*a phase shifting step for adding a predetermined number based upon said band switching signal to said address*" and "*a first analog converting step for analog-converting data which is read out by addressing said storing step based on the address outputted from said address generating step to thereby supply the analog-converted data to one of a pair of first quadrature mixers for converting either the reception signal or the reception intermediate frequency signal into reception baseband signal*" and "*a second analog converting step data which is read out by addressing said storing step based on the output of said phase shifting step to thereby supply the analog-converted data to the other of said first quadrature mixers*".

11. Claim 18 is allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 18, claim is allowed over the prior art of record because the cited references taken individually or in combination fail to particularly disclose a

communication method of a multiband data communication apparatus comprising "*a storing step for saving discrete data of a frequency pattern component functioning as a base*" and "*an address generating step for generating an address every preselected clock signal*" and "*a phase shifting step for adding a predetermined number based upon said band switching signal to said address*" and "*a first analog converting step for analog-converting data which is read out by addressing said storing step based on the address outputted from said address generating step to thereby supply the analog-converted data to one of a pair of second quadrature mixers for converting a transmission baseband signal into either the transmission signal or the transmission intermediate frequency signal*" and "*a second analog converting step for analog-converting data which is read out by addressing said storing step based on the output of said phase shifting step to thereby supply the analog-converted data to the other of said second quadrature mixers*".

12. Claim 19 is allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 19, claim is allowed over the prior art of record because the cited references taken individually or in combination fail to particularly disclose a communication method of a multiband data communication apparatus including "*a storing step for saving discrete data of a frequency pattern component functioning as a base*" and "*an address generating step for generating an address every preselected*

clock signal" and "*a phase shifting step for adding a predetermined number based upon said band switching signal to said address*" and "*a first analog converting step for analog-converting data which is read out by addressing said storing step based on the address outputted from said address generating step to thereby supply the analog-converted data to one of a first quadrature mixer and a second quadrature mixer, said first quadrature mixer converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal, and said second quadrature mixer converting a transmission baseband signal into either the transmission signal or the transmission intermediate frequency signal*" and "*a second analog converting step for analog-converting data which is read out by addressing said storing step based on the output of said phase shifting step to thereby supply the analog-converted data to the other of said first quadrature mixer and said second quadrature mixer*".

13. Claims 23-24 and 26-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See

MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KCT

Khanh Cong Tran 12/23/2005

Examiner KHANH TRAN